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Anthracite Survey Paper No. 7

November 26, 1945

THE FOREST SITUATION IN PIKE AND MONROE COUNTIES

PENNSYLVANIA

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This is the first of a series of seven brief reports on the forest condition in the counties of the Anthracite Forest Region. This Region includes 15 counties shown on the map on the back of this publication, which contain or surround the hard-coal deposits of Pennsylvania. Because of basic similarities, Pike and Monroe Counties are treated together. The purpose is to present tabular data from the Anthracite Forest Survey for local use, together with enough general information about the two counties to make the forest situation understandable. Forest areas and present condition of the forest were determined through interpretation of aerial photographs, and the distribution of the major forest types was ascertained largely by reconnaissance. Data on species, size-classes, volume, and growth applicable to the several forest types and condition classes were collected by detailed field surveys.

Acknowledgment is made to John A. Buttrick and Donald F. Robinson for aid in compiling and writing the report, and to Robert Bartlett for preparation of charts and maps.

FOREST SITUATION IN PIKE AND MONROE COUNTIES

PENNSYLVANIA

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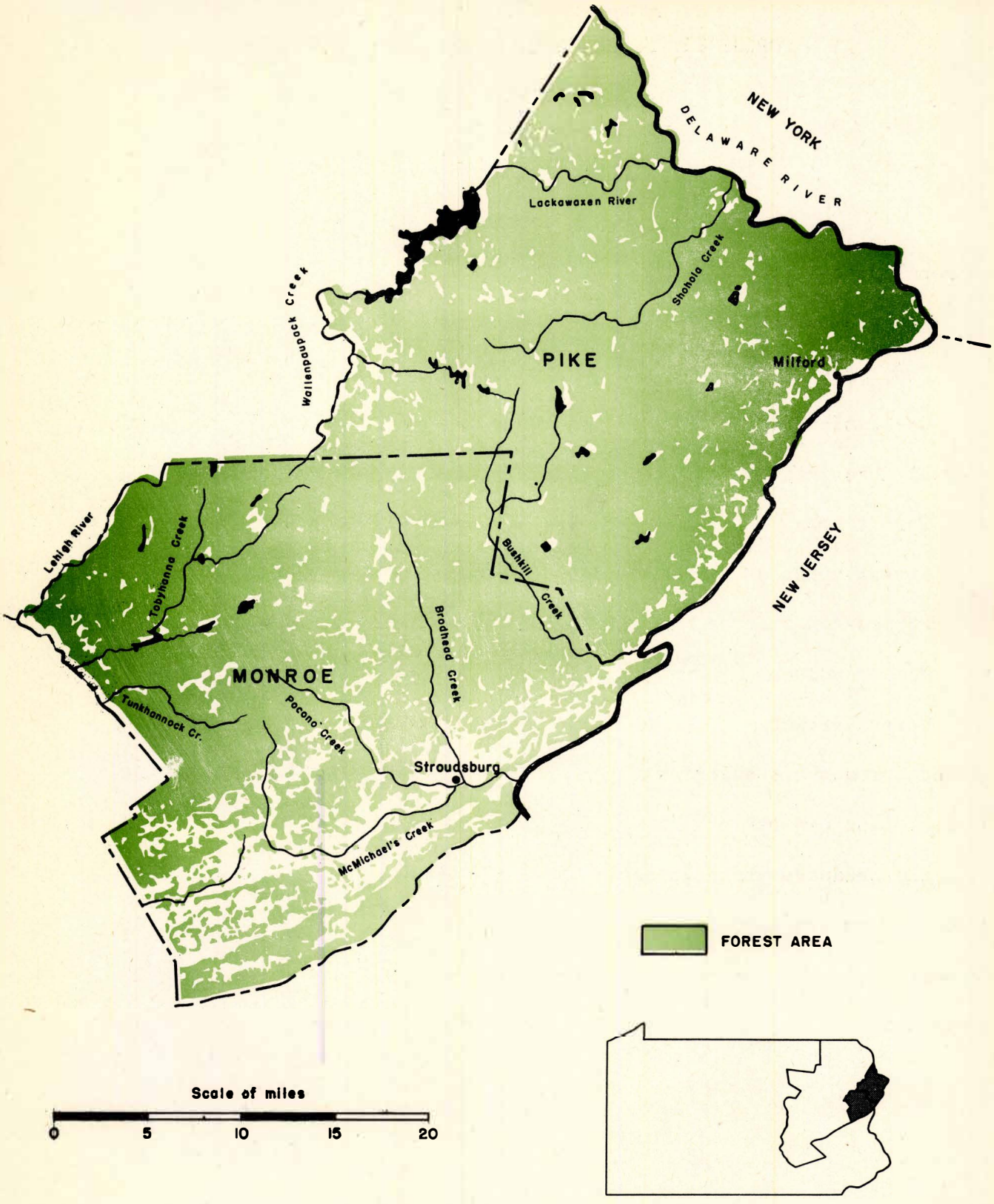


FIGURE 1 - FOREST AREA IN PIKE AND MONROE COUNTIES OF PENNSYLVANIA.

THE FOREST SITUATION IN PIKE AND MONROE COUNTIES

Extensive forests and high altitude have made Pike and Monroe Counties one of the playgrounds of the nation. Less than eighty miles from either New York or Philadelphia and accessible by both railroad and highway, they are visited each year by thousands. Not counting those who came for a day's picnicking or those who merely passed through, some quarter of a million people sought recreation in this section annually prior to World War II.

General Description

The total area of Pike and Monroe Counties is 1176 square miles or 752,650 acres, most of it on the eastern edge of the Allegheny Plateau. The narrow valley of the Delaware River, which forms the eastern boundary, widens at Stroudsburg where Broadhead Creek comes down from the northeast. Westward the land rises rapidly to a semi-mountainous tableland, reaching a height of over 2100 feet in northwestern Monroe. These uplands are dotted with numerous lakes and swamps, most of them of glacial origin. The largest lake, the Wallenpaupack, created by a power dam, lies along the western boundary of Pike. The Lackawaxen River crosses the northern part of Pike, and the upper course of the Lehigh River forms the western boundary of Monroe.

The climate is cool. The average summer temperature is about 64°F. Snow covers the ground about five months out of the year. The average annual precipitation is between 42 and 46 inches.

Transportation

Transportation facilities are fair. There are about 600 miles of improved state highway, and buses provide passenger service to parts of the area. The Delaware, Lackawanna, and Western Railroad crosses Monroe County, and the Erie Railroad crosses the northern part of Pike. Large areas of the two counties, however, are virtually inaccessible. There are three airports in Monroe.

Population

The population of Pike and Monroe Counties in 1940 was 37,254. Of this approximately one-third lives in the boroughs of Stroudsburg and East Stroudsburg. The largest center of population in Pike County is the borough of Matamoras, a suburb of Port Jervis, New York, with 1735 inhabitants. The rest of the population is scattered in smaller villages and in more or less isolated clusters along the highway. About 23 percent (8,452 persons) lives on farms. Although in Pike and Monroe Counties the death rate exceeds the birth rate, there has been enough movement into the former to increase the population and almost enough into the latter to keep it constant.

Occupations

The principal business is providing recreation, both summer and winter, to visiting vacationists. It is estimated that there are hotels, boarding-houses and camps with a total capacity of 15,000 persons, and private vacation homes for another 5000. The total investment in recreational facilities is about $25,000,000, and the gross annual income in normal times nearly $8,000,000. In Monroe County, for example, there are ten golf courses.

Manufacturing industries, most of which are located in and around Stroudsburg, provide employment for about 2,700 persons and have an annual output valued at about $9,000,000 (1940)[1]. Altogether there are 73 plants, of which 63 are in Monroe County. The most important industries are textile manufacture (16 plants), metal manufacture (10 plants), and printing (5 plants), which among them account for 84 percent of the value of the manufactured products of the two counties.

Farming opportunities are limited; in Pike County, farm land is generally classified as "below average" quality. In 1940 only 7 percent (51,384 acres) was cropland. There were 1,648 farms, and the total annual farm income (1939) was about $1,856,000. Fewer than 8 percent of the farms were being operated by tenants in 1940.

OCCUPATIONS OF POPULATION: 1940[2]

Total population		37,254	
Not in labor force		22,903	61%
In labor force		14,351	39%
Unemployed		2,941	20%
Employed		11,410	80%
Trade and service		5,535	49%
Manufacturing			
Metal	620)		
Textile	1,139)		
Food	130)	2,563	22%
Other	674)		
Agriculture		1,460	13%
Construction		899	8%
Transportation		720	6%
Forest products industries			
Forestry	39)		
Logging	80)		
Milling	57)	205	
Wood manufacture	12)		
Paper manufacture	17)		
Quarrying and other mining		27	*
Coal mining		1	*

*negligible

1/ Tenth Industrial Directory of the Commonwealth of Penna.; Dept. of Intern Affairs; compiled by Bureau of Statistics, Harrisburg 1941

2/ This table, based on the U. S. Census for 1940, indicates the primary

Forest Description

During the nineteenth century by far the largest industry in Pike and Monroe Counties was lumbering, and for many years the forests provided most of the income of the area. In the early part of the nineteenth century the magnificent virgin stands of white pine and the larger high-quality pitch pine were felled. In the latter part the hemlock was cut for tanning bark and in many instances the wood itself left to rot. About 1880 the hardwoods were first removed for rough construction lumber. During the last thirty or forty years improved transportation facilities and the increased needs of the anthracite industry have resulted in the cutting of much of the young timber for use in the mines of the northern coal field. Fire has done great damage to the forests in the past. But in recent years severe burning has largely been confined to the scrub oak areas of southwestern Monroe.

Forest area

These counties are largely in woodland, especially Pike, of which only a little over one-tenth is cleared (fig. 1)3/. The greater part of this forest land is virtually a solid block covering almost the entire upland of the two counties. Nearly 95 percent is in tracts of 50 acres or larger4/. A small proportion is in scattered tracts along the valley of the Delaware River.

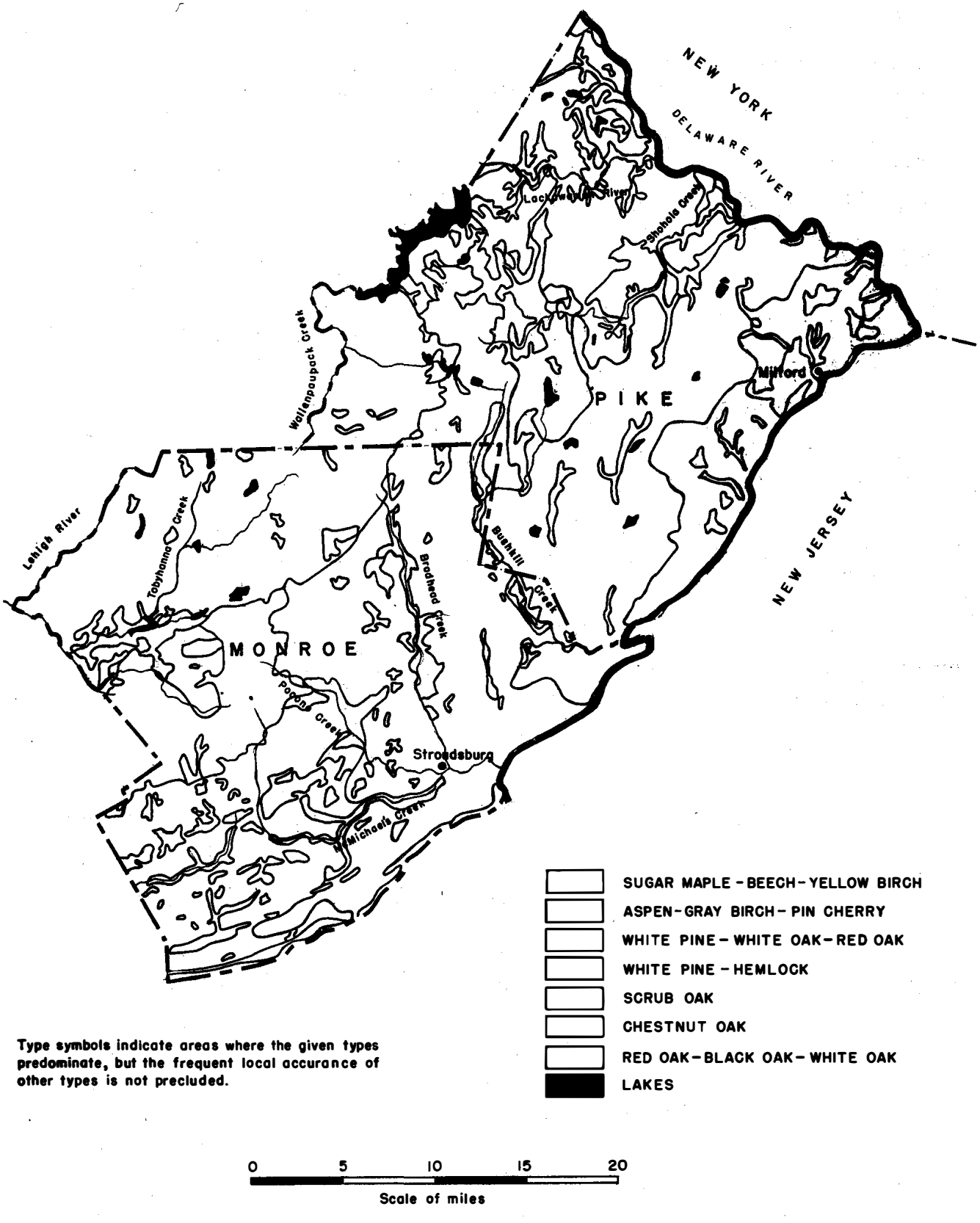
	Pike		Monroe	
	Acres	Percent	Acres	Percent
Forest land	317,200	89	307,900	78
Nonforest	39,900	11	87,700	22
Gross area	357,100	100	395,600	100

---

occupations of the residents of Pike and Monroe Counties. The figures given in the text, on the other hand, are based on the employment provided by industries located within these counties. Discrepancies are due to the fact that many people live in one area and work in another. The figures given for forest products industries do not reflect all of the employment for these industries, because a considerable amount of the work is done on a part-time basis by men whose income is derived chiefly from other occupations.

3/ Maps showing the location of all forest tracts are available in a scale of 1" = 1 mile for each county; similar maps showing forest condition are also available. These maps may be ordered through the Northeastern Forest Experiment Station, 614 Bankers Securities Building, Philadelphia 7, Pa. A postal or express money order, draft or check made out to the Treasurer of the United States, covering the full amount, should accompany the order. Prints will be forwarded from the Forest Service, Division of Engineering in Washington, D. C. Each map will cost: Pike County $ .44, Monroe County $ .56.

4/ For detail, see supplementary tables in the Appendix.



Type symbols indicate areas where the given types predominate, but the frequent local accurance of other types is not precluded.

Figure 2. - AREAS CHARACTERIZED BY THE MAJOR FOREST TYPES IN PIKE AND MONROE COUNTIES

Forest types

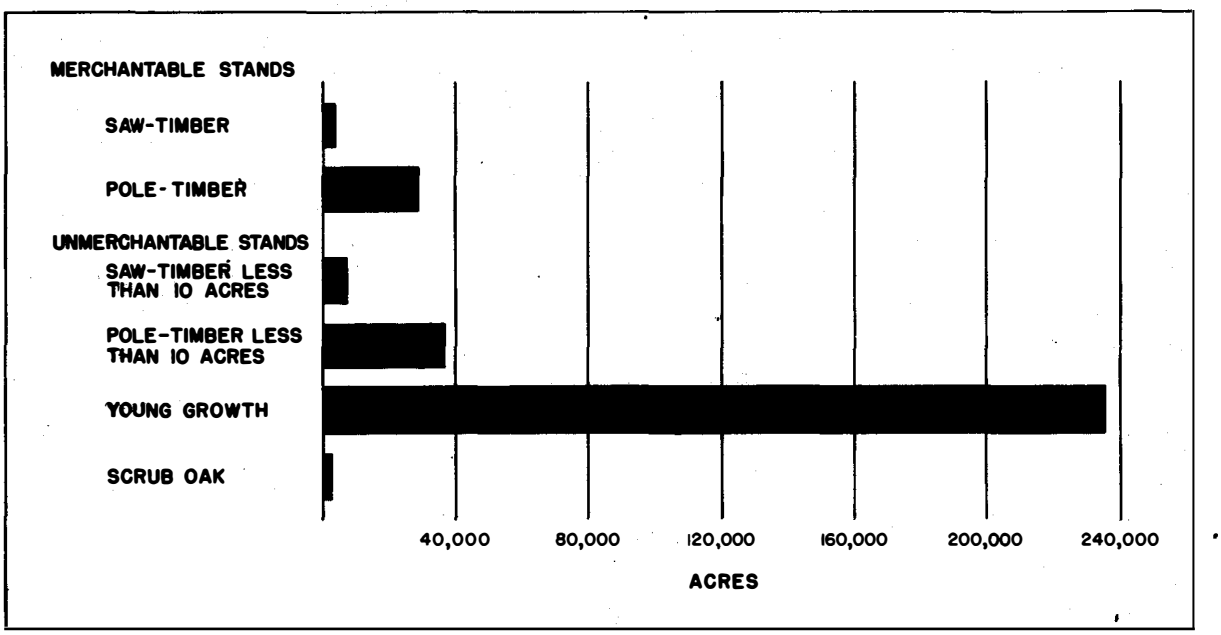
The present forests of Pike and Monroe Counties are dominated by hardwoods (fig. 2). The red oak - black oak - white oak type, interspersed with the white pine - white oak - red oak type, covers the bulk of the region. Some small virgin stands of conifers remain, saved for their aesthetic value or by virtue of their inaccessibility; in addition there are sizable areas in young white pine or mixed white pine and hemlock and a few stands of almost pure second-growth hemlock in southwestern Monroe. Here and there in swampy places on the highlands are stands of spruce. White cedar occurs sporadically. There are numerous patches of scrub oak, including one large area in western Monroe, portions of which may have been covered with this type for centuries. Along the streams in the neighborhood of Stroudsburg the river birch - sycamore type is to be found, and the chestnut - oak type dominates the ridge of Blue Mountain. Finally, in northern Monroe and southwestern Pike a major type change occurs. Here, where fire in the slash left after clear-cutting has destroyed much of the more valuable reproduction, is sugar maple - beech - yellow birch, with occasional stands of aspen.

Forest condition

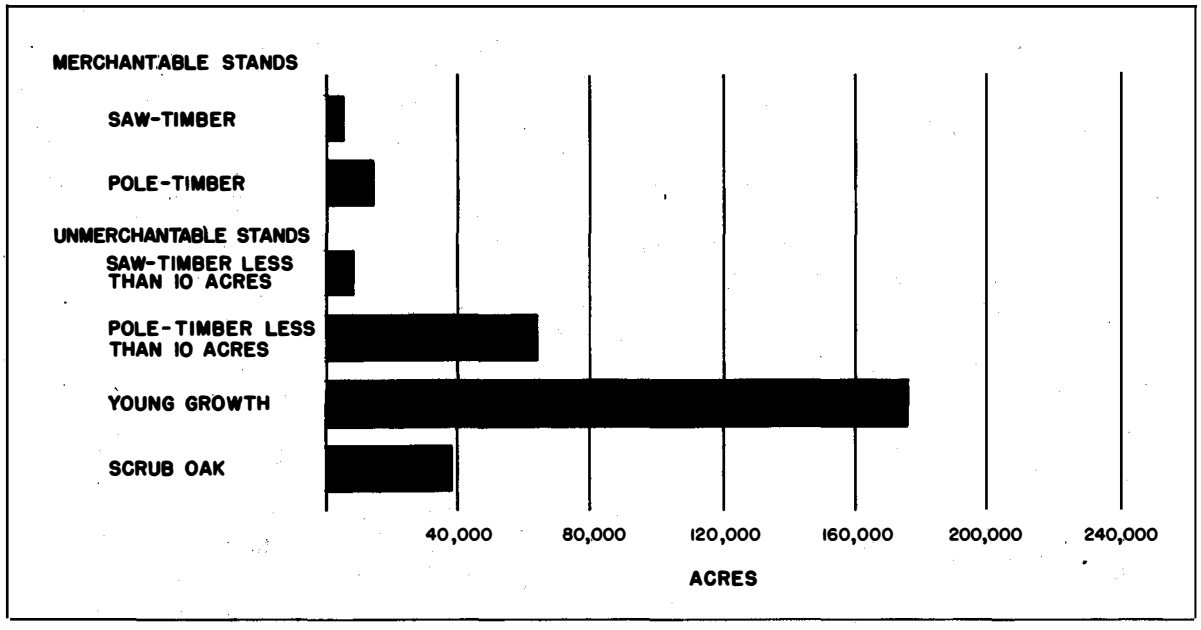
Nine-tenths of the forest land in Pike County and slightly more in Monroe bears unmerchantable stands[5/]. Most of these unmerchantable stands are, however, in good condition and fairly well stocked with young growth of commercial species. In Pike County many areas that had a considerable amount of scrub oak twenty years ago are now fully stocked with commercial species of oak. This improvement is largely from the control of fire by the Pennsylvania Department of Forests and Waters during the past 30 years. In both counties the spruce swamps are well stocked with reproduction. White pine, on the other hand, is tending to disappear as a result of heavy cutting and the competition of hardwoods. And in Monroe County there are large areas of solid scrub oak and some areas dominated by the aspen - gray birch - pin cherry type. Much of this territory is burned over periodically to improve blueberry reproduction; and one large area near Pimple Hill in western Monroe has been classified for several years by the Department of Forests and Waters as a non-protection area.

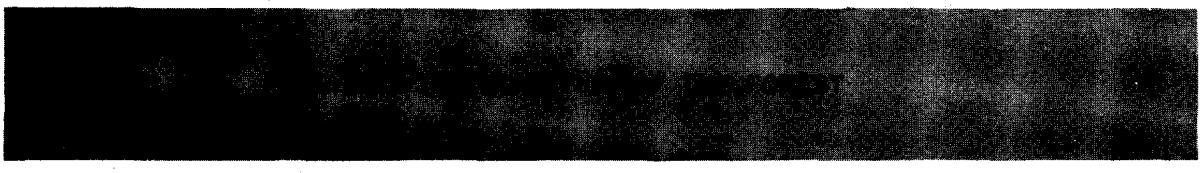
5/ The condition classes recognized are: 1. Saw-timber stands: stands of 10 acres or larger, each of which contains at least 2000 board feet of saw timber. 2. Pole-timber stands: stands of 10 acres or larger, each acre of which contains a minimum timber volume of approximately 5 standard cords in trees 5.0 inches diameter breast high (hereafter denoted by the initials d.b.h.) and larger, and less than 2000 board feet of saw timber. 3. Unmerchantable stands: areas of forest land which contain less than the minimum volume for pole-timber stands, plus stands of saw timber and pole timber of less than 10 acres in extent, whether isolated tracts or stands within larger forest areas.

PIKE COUNTY



MONROE COUNTY





The proportion of forest land in the different forest condition classes is shown in figure 3. The chart indicates the high proportion of the unmerchantable area which is in young growth of commercial species. The 4,600 acres of aspen - gray birch - pin cherry stands in Monroe County are included in the pole-timber stands of less than 10 acres.

Timber volume

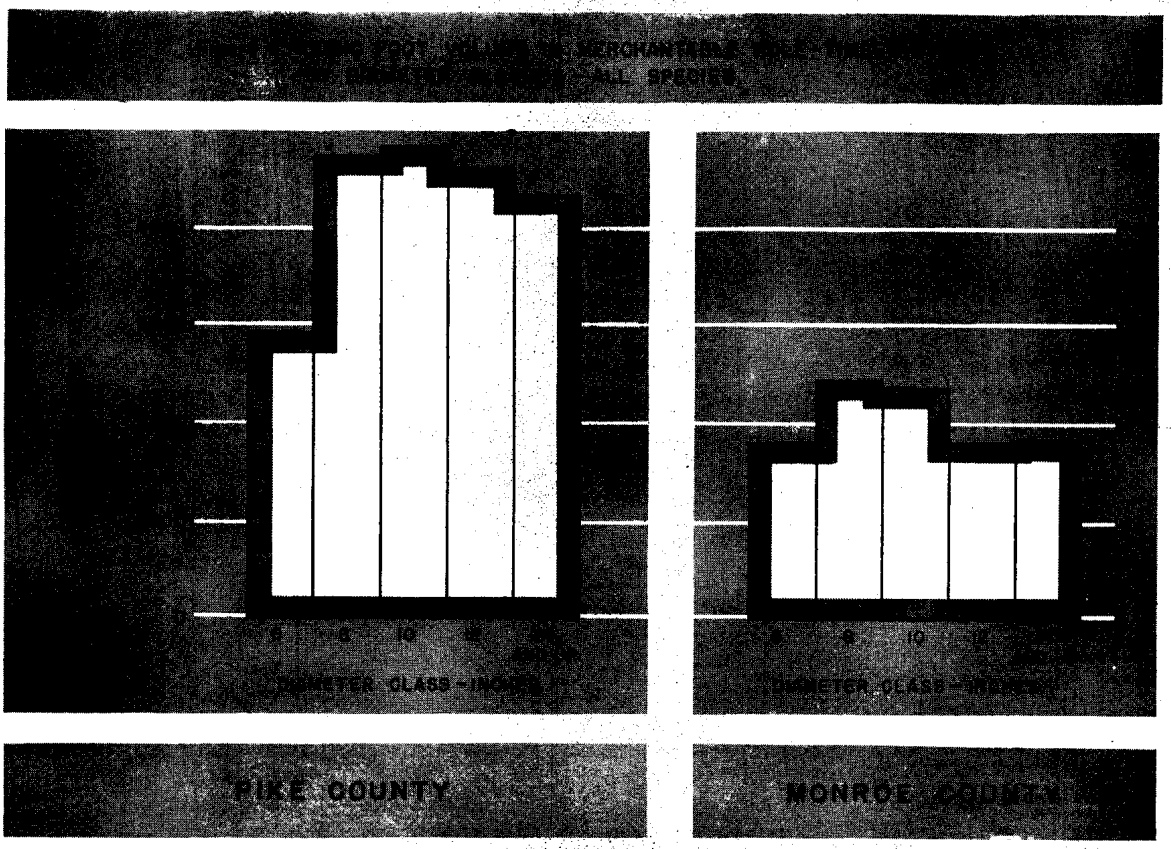
The volume of saw timber and the green weight of all timber are shown in the following table:[6]

	PIKE		MONROE	
	M bd.ft.	Tons	M bd.ft.	Tons
Saw-timber stands	24,400	201,600	33,200	270,800
Pole-timber stands	40,800	585,600	15,500	286,200
Unmerchantable stands	76,000	1,520,900	90,300	1,343,200
Total	141,200	2,308,100	139,000	1,900,200

The distribution of the cubic-foot volume in the merchantable pole-timber stands by tree size may be seen in figure 4. The fact that Pike County has twice the pole-timber area of Monroe County is reflected in the relative volumes in each. Especially in Monroe the greater part of the material in these stands is in hardwoods.

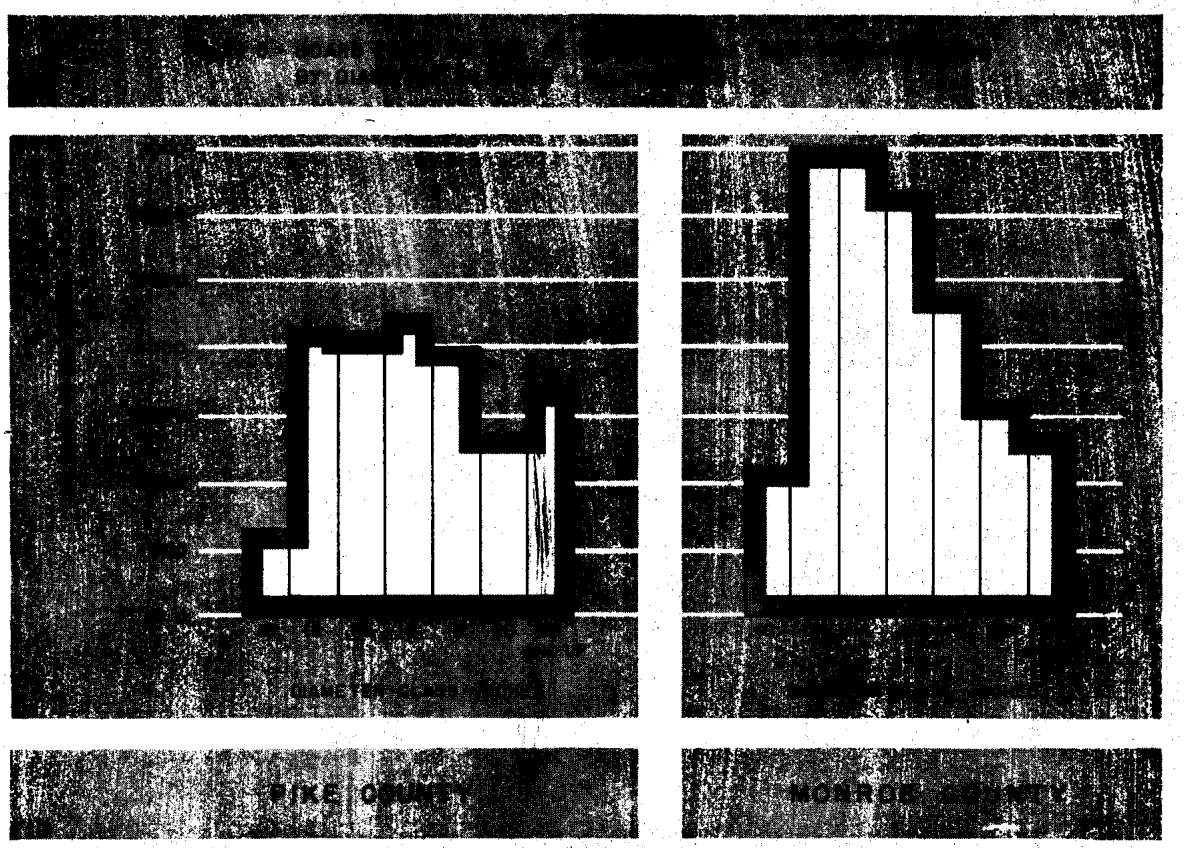
	PIKE		MONROE	
	Tons	Percent	Tons	Percent
Conifers	118,200	20	35,600	12
Oaks, hickory, sugar maple	355,200	61	175,500	62
Other hardwoods	112,200	19	75,100	26
Total	585,600	100	286,200	100

6/ Saw-timber volume is the net board foot of sawlog-size material in conifers 9.0 inches d.b.h. and larger, plus the net volume of sawlog-size material in hardwoods 11 inches d.b.h. and larger. Board foot volumes were based on the International 1/4" log rule, which closely approximates green lumber tally. Deductions were made for cull. Total timber volume is the volume of all trees 5.0 inches and larger, including bark and the tops and limbs to a 4-inch diameter. This was computed in cubic feet and converted to tons (green weight) by the application of cubic foot-per-ton factors, varying by species groups and averaging about 35 cubic feet per ton.



Of the merchantable saw-timber stands, 58 percent are in Monroe County. These stands are of two sorts. Some few are composed of mature and over-mature trees. On the other hand, there is a considerable acreage of young saw timber. About 30 percent of the area in saw-timber stands averages 8,000 board feet to the acre or better:

	PIKE		MONROE	
Thousand Board Feet per Acre	Acres	M bd.ft.	Acres	M bd.ft.
8 and more	1,000	11,200	1,700	17,000
6 to 8	1,000	6,400	900	7,000
4 to 6	1,000	4,400	1,400	5,800
2 to 4	800	2,400	1,200	3,400
Total	3,800	24,400	5,200	33,200



The species distribution of the trees in saw-timber stands is quite different from that in pole-timber stands. Nearly half of the volume is in conifers:

	PIKE		MONROE	
	M bd.ft.	Percent	M bd.ft.	Percent
Conifers	11,900	49	16,000	48
Oaks, hickory, sugar maple	6,600	27	9,900	30
Other hardwoods	5,900	24	7,300	22
Total	24,400	100	33,200	100

The distribution of the volume in saw-timber stands by tree size may be seen in figure 5.

Current forest growth

The following tables show the total timber growth and the saw-timber growth of the different condition classes in the two counties:

1943

Total timber growth

	PIKE M cu.ft.	MONROE M cu.ft.
Saw-timber stands	271	370
Pole-timber stands	1,259	614
Unmerchantable stands	4,508	3,888
Total timber growth	6,038	4,872

Saw-timber growth

	M bd.ft.	M bd.ft.
Saw-timber stands	1,080	1,470
Pole-timber stands	1,330	1,060
Unmerchantable stands	4,910	6,040
Total saw-timber growth	7,320	8,570

Forest Products Industries

At one time there were a number of large sawmills along the Delaware River in Pike and Monroe Counties, and log-drives were made each spring down the smaller streams and along the Delaware to these mills. It is many years now since timber has been cut in such quantities or since there has been any such timber to cut as supplied the lumber mills of the last century. But even today, especially in Pike, lumbering remains an important industry. In 1942 there were 54 sawmills in the two counties and 9,300,000 board feet of lumber was produced. The number of these mills by production classes is shown in the following table:

Production class Thousand board feet	PIKE Number of mills	MONROE Number of mills
Idle	2	4
1 to 50	6	12
50 to 500	13	11
500 to 1000	3	1
Over 1000	2	0
Total	26	28

In addition to lumber manufacture, mine-timber production is carried on. A considerable cubic footage is removed annually for this purpose, some of it from saw-log material. Some fuelwood and fence posts are cut each year, and a small amount of white ash from this area is sent to the

handle factory at Wyoming, Luzerne County, Pennsylvania. The only other wood-using manufactures in Pike and Monroe County are three planing mills in the vicinity of Stroudsburg, which together employ 19 persons.

Forest Land ownership

About a fifth of the forest land is in public ownership, and a tenth is owned by farmers. The rest is held by other private owners, much of it in large blocks. In Pike County nine very large blocks belong to sportsmen's clubs. In Monroe County 29 percent of the forest area is in the hands of resort owners, and over 7 percent of the total belongs to seven of these. The ownership distribution of the forest land in the two counties is as follows:

	PIKE Acres	MONROE Acres
Public ownership		
Federal (Tobyhanna Military Reservation)	-	21,000
State (Department of Forests and Waters)	59,600	6,600
State Game Commission	8,000	13,900
County	1,300	9,200
Community	-	600
Total public ownership	68,900	51,300
Private ownership		
Farmers	27,400	33,700
Others	220,900	222,900
Total private ownership	248,300	256,600

The Delaware State Forest

The Delaware State Forest consists of a number of disconnected tracts of varying sizes, most of them in Pike County, under the supervision of the District Forester of the Department of Forests and Waters. The acquisition of this forest land began in 1898 with the purchase for $230 of 1519 acres in Pike County at a county treasurer's sale. Most of the land purchased since then has been bought at tax sales or from lumber companies that had already stripped it of forest, and has cost an average of $1.50 an acre.

Fire control, timber stand improvement, and recreation have been the principal concerns of the management of this State Forest. Seven lookout towers have been erected, three of them within the State Forest

and four on private lands. Considerable planting, much of it spot-planting, has also been done. Between 1899 and 1939 over 1,146,000 seedlings were set out in this forest. Indeed, the first plantation on any state land in Pennsylvania was set out in the Minisink Division in 1899.

The State Forest includes two forest parks that have been developed for recreational purposes. At the more highly developed of these, the Promised Land State Forest Park, there are tourist camping facilities, cabins, and equipment for swimming and boating. Camping facilities include fireplaces, good spring water, tables, benches, shelter, and parking areas. In other parts of the State Forest more than 800 camp sites have been leased to individuals and organizations for cabins, lodges, and summer homes.

Pocono Forestry Association

Monroe County is the home of one of the oldest forestry organizations in the country, the Pocono Forestry Association with present headquarters at Buck Hill Falls. This association was founded in 1902 for the purpose of fighting forest fires throughout the Poconos. Since the establishment of the present fire control system under the State Department of Forests and Waters, the Association has directed its attention towards planting and forest development. It has at present a membership of about 500.

Future Outlook in Brief

The outlook for the future of the forests of Pike and Monroe Counties is on the whole promising. Although exact information on drain for such small units as counties is not available, the indications are that the forests here are now growing more rapidly than they are being cut. Except for the scrub oak areas and a few residual saw-timber stands, they consist of young growth of potentially good timber. If the vast area of young stands is adequately protected from fire, insects, and disease, and from overcutting, future productive forests can be developed. An increasing awareness on the part of forest land owners of the need for forest conservation and improvement points toward a realization of these forest potentialities. Many owners have initiated improvements in their forest holdings. Some are concerned with timber production. Others realize that healthy, attractive forests are an asset from the point of view of the recreational developments that play so important a part in the economy of the two counties.

Restoration of the forests will be expedited through planting in some areas. The principal measures required, however, are:

1. Stop clear cutting. Too often young, rapidly growing stands are heavily cut over to provide mine timbers. Such stands, if properly cared for and allowed to grow to maturity, would provide this area with a large part of its requirement for high-grade building material.

2. Improve timber stands. Improvement cuttings and thinnings which remove low quality material will aid the development of productive forests. Much of the material removed can be used for mine timbers and other products. The Northeastern Forest Experiment Station is conducting research into management practices for the forest types of the Anthracite Forest Region. These studies should provide information on proper practices for these counties.

3. Study the relation of fire to blueberry production. Exact information as to the benefits to be derived from burning blueberry areas is needed; fires often get out of control and burn other areas. Even within the blueberry area fires destroy the humus, which is a valuable factor in detaining water. One of the principal blueberry areas is in the watershed of the Lehigh River, which has been subject to damaging floods. To what extent can these detrimental results be avoided, and in how great a degree are they offset by benefits to the blueberry crop?

4. Spread knowledge of good forestry practices. This already is being done by the State Department of Forests and Waters and the Pocono Forestry Association. But much more educational activity is needed. Assignment of a Farm Forester to work solely in these two counties would be well justified by the importance of the farm woodlands here. Eventually, it might be desirable for farmers to form a forest cooperative.

APPENDIX

Tables 1 to 9 - Pike County

Tables 10 to 18 - Monroe County

PIKE COUNTY

Table 1. Land use

Land use	Area	Proportion of class	Proportion of gross area
	Acres	Percent	Percent
Forest 1/			
Tracts less than 10 acres	1,100	0.3	0.3
Tracts 10 up to 50 acres	1,400	0.5	0.4
Tracts 50 acres and over	314,700	99.2	88.1
All forest land	317,200	100.0	88.8
Nonforest			
Cropland 2/	7,700	19.3	2.2
Water 2/	8,100	20.3	2.3
Other	24,100	60.4	6.7
All nonforest land	39,900	100.0	11.2
Gross area	357,100	100.0	100.0

1/ Based on aerial photographs taken in 1938 - 1939

2/ Bureau of the Census, 1940

Table 2 - Forest area by minor civil divisions

Civil division 1/	Gross area	Nonforest area	Forest area	Proportion gross area in forest	Proportion of county forest land
	Acres	Acres	Acres	Percent	Percent
Blooming Grove t.	48,200	2,200	46,000	95.4	14.5
Delaware t.	29,200	3,400	25,800	88.4	8.1
Dingman t.	36,800	4,600	32,200	87.6	10.2
Greene t.	38,300	5,600	32,700	85.3	10.3
Lackawaxen t.	51,000	6,700	44,300	86.9	14.0
Lehman t.	31,400	5,500	25,900	82.4	8.2
Milford t., Milford b.	8,600	1,500	7,100	82.7	2.2
Palmyra t.	25,500	4,500	21,000	82.2	6.6
Porter t.	38,800	1,300	37,500	96.7	11.8
Shohola t.	28,900	2,200	26,700	92.2	8.4
Westfall t., Matamoras b.	20,400	2,400	18,000	88.2	5.7
All civil divisions	357,100	39,900	317,200	88.8	100.0

1/ Abbreviations: t. - township, b. - borough

Table 3 - Forest area by forest types and conditions

Forest type	Merchantable stands				Unmerchantable stands		All stands	
	Saw-timber		Pole-timber					
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Sugar maple - beech - yellow birch	1,000	26.3	5,100	17.3	17,700	6.2	23,800	7.5
White pine - hemlock	1,400	36.8	5,400	18.4	24,100	8.5	30,900	9.7
White pine - white oak - red oak	900	23.7	9,700	33.0	90,800	32.0	101,400	32.0
Red oak - black oak - white oak	500	13.2	9,000	30.6	145,200	51.1	154,700	48.8
Chestnut oak	--	--	--	--	100	0.1	100	0.1
Scrub oak	--	--	--	--	2,500	0.9	2,500	0.8
Other	--	--	200	0.7	3,600	1.3	3,800	1.2
All forest types	3,800	100.0	29,400	100.0	284,000	100.0	317,200	100.0

Table 4 - Volume by forest types

Forest type	Saw-timber volume M bd.ft.	Total volume M cu.ft.
Sugar maple - beech - yellow birch	19,600	10,400
Aspen - gray birch - pin cherry	--	--
White pine - hemlock	28,700	12,910
White pine - white oak - red oak	43,300	28,310
Red oak - black oak - white oak	47,900	32,090
Chestnut oak	--	10
Scrub oak	--	30
Other	1,700	1,610
All forest types	141,200	85,450

Table 5 - Forest area by forest conditions and volume-per-acre classes

Forest condition and volume-per-acre classes	Area	Proportion of each condition	Proportion of total forest land
	Acres	Percent	Percent
Merchantable:			
Saw-timber stands 1/ (bd. ft. per acre)			
8,000 and over	1,000	26.3	0.3
6,000 to 7,999	1,000	26.3	0.3
4,000 to 5,999	1,000	26.3	0.3
2,000 to 3,999	800	21.1	0.3
All saw-timber stands	3,800	100.0	1.2
Pole-timber stands 2/ (cords per acre)			
10.0 and over	13,000	44.2	4.1
5.0 to 9.9	16,400	55.8	5.2
All pole-timber stands	29,400	100.0	9.3
All merchantable stands	33,200		10.5
Unmerchantable:			
Saw-timber stands less than 10 acres	7,700		2.4
Pole-timber stands less than 10 acres	37,300		11.8
Young growth stands	236,500		74.5
Scrub oak stands	2,500		0.8
All unmerchantable stands	284,000		89.5
All forest land	317,200		100.0

1/ In stands 10 acres or larger each acre of which has at least 2,000 board feet (lumber tally).

2/ In stands 10 acres or larger each acre of which has at least 5 cords (400 cubic feet) but less than 2,000 board feet

Table 6 - Volume by forest conditions and volume-per-acre classes

Forest condition and volume-per-acre classes	Saw-timber volume (lumber tally) 1/		Total volume (including bark)			
	M bd.ft.	Percent	M cu.ft.	Percent	Cords	Tons
Merchantable:						
Saw-timber stands (bd. ft. per acre)						
8,000 and over	11,200	7.9	2,980	3.5	38,300	78,000
6,000 to 7,999	6,400	4.6	2,000	2.3	25,700	52,400
4,000 to 5,999	4,400	3.1	1,610	1.9	20,700	42,200
2,000 to 3,999	2,400	1.7	1,110	1.3	14,300	29,000
All saw-timber stands	24,400	17.3	7,700	9.0	99,000	201,600
Pole-timber stands (cords per acre)						
10.0 and over	23,700	16.8	11,510	13.5	149,000	315,100
5.0 to 9.9	17,100	12.1	9,910	11.6	127,900	270,500
All pole-timber stands	40,800	28.9	21,420	25.1	276,900	585,600
All merchantable stands	65,200	46.2	29,120	34.1	375,900	787,200
All unmerchantable stands	76,000	53.8	56,330	65.9	751,100	1,520,900
All forest land	141,200	100.0	85,450	100.0	1,127,000	2,308,100

1/ Based on the International 1/4-inch rule which closely approximates green lumber tally.

Table 7 - Volume in merchantable stands by species groups

Merchantable class and species group	Saw-timber volume (lumber tally)		Total volume (including bark)					
	M bd.ft.	Percent	M cu.ft.	Percent	Cords 1/	Percent	Tons 2/	Percent
Saw-timber stands								
Conifers	11,900	48.8	2,340	30.4	27,500	27.8	49,100	24.4
Oaks, hickory, and hard maple	6,600	27.0	2,960	38.4	39,500	39.9	89,700	44.4
Other hardwoods	5,900	24.2	2,400	31.2	32,000	32.3	62,800	31.2
All species	24,400	100.0	7,700	100.0	99,000	100.0	201,600	100.0
Pole-timber stands								
Conifers	14,300	35.0	5,530	25.8	65,100	23.5	118,200	20.2
Oaks, hickory, and hard maple	18,600	45.8	11,650	54.4	155,300	56.1	355,200	60.6
Other hardwoods	7,900	19.2	4,240	19.8	56,500	20.4	112,200	19.2
All species	40,800	100.0	21,420	100.0	276,900	100.0	585,600	100.0
All merchantable stands	65,200		29,120		375,900		787,200	

1/ Based on 85 cubic feet per cord for conifers and 75 cubic feet per cord for hardwoods.

2/ Based on cubic feet-per-ton converting factors for the principal species.

Table 8 - Board foot volume in merchantable saw-timber stands by diameter classes and species groups

Diameter class (d.b.h.)	Conifers 1/		Oaks, hickory, hard maple 2/		Other hardwoods 3/		All species	
Inches	M bd.ft.	Percent	M bd.ft.	Percent	M bd.ft.	Percent	M bd.ft.	Percent
10	1,300	10.9					1,300	5.3
12	1,600	13.4	1,400	21.2	1,300	22.1	4,300	17.6
14	1,800	15.1	1,400	21.2	1,000	16.9	4,200	17.2
16	2,000	16.8	1,400	21.2	1,100	18.6	4,500	18.5
18	2,000	16.8	900	13.6	1,100	18.6	4,000	16.4
20	1,400	11.8	600	9.2	700	11.9	2,700	11.1
22 and up	1,800	15.2	900	13.6	700	11.9	3,400	13.9
All classes	11,900	100.0	6,600	100.0	5,900	100.0	24,400	100.0

1/ Principally white pine, hemlock and pitch pine, with some black spruce.

2/ Principally white oak, red oak, and hard maple, with some hickory and chestnut, black, scarlet and pin oaks.

3/ Principally red maple, beech, yellow birch, and white ash, with some black cherry, black birch, walnut, basswood, elm, sycamore and willow.

Table 9 - Cubic foot volume in merchantable pole-timber stands by diameter classes and species groups

Diameter class (d.b.h.)	Conifers 1/			Oaks, hickory, and hard maple 2/			Other hardwoods 3/			All species		
Inches	M cu.ft.	Percent	Tons	M cu.ft.	Percent	Tons	M cu.ft.	Percent	Tons	M cu.ft.	Percent	Tons
6	390	7.1	8,400	1,820	15.6	55,400	720	17.0	19,100	2,930	13.7	82,900
8	840	15.2	18,000	2,640	22.7	80,600	1,240	29.2	32,800	4,720	22.0	131,400
10	1,500	27.1	32,000	2,500	21.5	76,400	800	18.9	21,200	4,800	22.4	129,600
12	1,440	26.0	30,700	2,530	21.7	77,100	630	14.9	16,700	4,600	21.5	124,500
14 & up	1,360	24.6	29,100	2,160	18.5	65,700	850	20.0	22,400	4,370	20.4	117,200
All classes	5,530	100.0	118,200	11,650	100.0	355,200	4,240	100.0	112,200	21,420	100.0	585,600

1/ Principally white pine, hemlock, and pitch pine, with some black spruce.

2/ Principally white, red, and chestnut oak and hard maple, with some hickory and black oak, scarlet oak and pin oak.

3/ Principally red maple, yellow birch, beech, and white ash, with some black cherry, black birch, walnut, basswood, elm, sycamore, willow, and aspen.

Table 10 - Land use

Land use	Area	Proportion of class	Proportion of gross area
	Acres	Percent	Percent
Forest 1/			
Tracts less than 10 acres	4,300	1.4	1.1
Tracts 10 up to 50 acres	4,700	1.5	1.2
Tracts 50 acres and over	298,900	97.1	75.5
All forest land	307,900	100.0	77.8
Nonforest			
Cropland 2/	43,700	49.8	11.1
Water 2/	4,500	5.1	1.1
Other	39,500	45.1	10.0
All nonforest land	87,700	100.0	22.2
Gross area	395,600	100.0	100.0

1/ Based on aerial photographs taken in 1938-1939

2/ Bureau of the Census, 1940

Table 11 - Forest area by minor civil divisions

Civil division 1/	Gross area	Nonforest area	Forest area	Proportion gross area in forest	Proportion of county forest land
	Acres	Acres	Acres	Percent	Percent
Barrett t.	33,200	3,800	29,400	88.7	9.6
Chestnuthill t.	23,200	8,200	15,000	64.5	4.8
Coolbaugh t., Mt.Pocono b.	59,000	3,800	55,300	93.5	17.9
Eldred t.	17,600	6,400	11,200	63.4	3.6
Hamilton t.	26,100	11,200	14,900	56.9	4.8
Jackson t.	18,400	3,800	14,600	79.5	4.8
Middle Smithfield t.	34,800	7,600	27,200	78.3	8.8
Paradise t.	13,600	2,700	10,900	79.7	3.5
Pocono t.	22,300	4,600	17,700	79.3	5.8
Polk t.	18,900	6,200	12,600	66.8	4.1
Price t.	14,900	1,000	13,900	93.5	4.5
Ross t.	15,400	4,700	10,700	69.4	3.5
Smithfield t., Delaware Water Gap b.	17,100	7,400	9,700	57.0	3.2
Stroud t., E.Stroudsburg b., and Stroudsburg b.	23,200	10,700	12,500	53.8	4.1
Tobyhanna t.	33,700	3,700	30,000	89.2	9.8
Tuckhannock t.	24,200	1,900	22,300	92.2	7.2
All civil divisions	395,600	87,700	307,900	77.8	100.0

1/ Abbreviations: t. - township, b. - borough

Table 12 - Forest area by forest types and conditions

Forest type	Merchantable stands				Unmerchantable stands		All stands	
	Saw-timber		Pole-timber					
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Sugar maple - beech - yellow birch	1,700	32.7	5,400	37.0	80,600	28.0	87,700	28.5
Aspen - gray birch - pin cherry	--	--	--	--	4,600	1.6	4,600	1.5
White pine - hemlock	1,200	23.1	3,300	22.6	29,800	10.3	34,300	11.1
White pine - white oak - red oak	700	13.5	2,600	17.8	33,000	11.5	36,300	11.8
Red oak - black oak - white oak	1,500	28.8	3,200	21.9	94,000	32.6	98,700	32.1
Chestnut oak	--	--	--	--	5,000	1.7	5,000	1.6
Scrub oak	--	--	--	--	38,900	13.5	38,900	12.6
Other	100	1.9	100	0.7	2,200	0.8	2,400	0.8
All forest types	5,200	100.0	14,600	100.0	288,100	100.0	307,900	100.0

Table 13 - Volume by forest types

Forest type	Saw-timber volume	Total volume
	M bd.ft.	M cu.ft.
Sugar maple - beech - yellow birch	53,700	27,400
Aspen - gray birch - pin cherry	100	1,290
White pine - hemlock	27,600	11,380
White pine - white oak - red oak	16,300	9,230
Red oak - black oak - white oak	38,400	19,730
Chestnut oak	700	520
Scrub oak	600	470
Other	1,600	1,150
All forest types	139,000	71,170

Table 14 - Forest area by forest conditions and volume-per-acre classes

Forest condition and volume-per-acre classes	Area	Proportion of each condition	Proportion of total forest land
	Acres	Percent	Percent
Merchantable:			
Saw-timber stands 1/ (bd. ft. per acre)			
8,000 and over	1,700	32.7	0.5
6,000 to 7,999	900	17.3	0.3
4,000 to 5,999	1,400	26.9	0.5
2,000 to 3,999	1,200	23.1	0.4
All saw-timber stands	5,200	100.0	1.7
Pole-timber stands 2/ (cords per acre)			
10.0 and over	5,200	35.6	1.7
5.0 to 9.9	9,400	64.4	3.0
All pole-timber stands	14,600	100.0	4.7
All merchantable stands	19,800		6.4
Unmerchantable:			
Saw-timber stands less than 10 acres	8,400		2.7
Pole-timber stands less than 10 acres	64,700		21.0
Young growth stands	176,100		57.3
Scrub oak stands	38,900		12.6
All unmerchantable stands	288,100		93.6
All forest land	307,900		100.0

1/ In stands 10 acres or larger each acre of which has at least 2,000 board feet (lumber tally).

2/ In stands 10 acres or larger each acre of which has at least 5 cords (400 cubic feet) but less than 2,000 board feet.

Table 15 - Volume by forest conditions and volume-per-acre classes

Forest condition and volume-per-acre classes	Saw-timber volume (lumber tally) 1/		Total volume (including bark)			
	M bd.ft.	Percent	M cu.ft.	Percent	Cords	Tons
Merchantable:						
Saw-timber stands (bd. ft. per acre)						
8,000 and over	17,000	12.2	4,620	6.5	58,900	118,300
6,000 to 7,999	7,000	5.0	2,230	3.2	28,400	57,100
4,000 to 5,999	5,800	4.2	2,160	3.0	27,500	55,300
2,000 to 3,999	3,400	2.4	1,560	2.2	20,000	40,100
All saw-timber stands	33,200	23.8	10,570	14.9	134,800	270,800
Pole-timber stands (cords per acre)						
10.0 and over	7,900	5.7	4,700	6.6	61,500	130,800
5.0 to 9.9	7,600	5.5	5,590	7.8	73,000	155,400
All pole-timber stands	15,500	11.2	10,290	14.4	134,500	286,200
All merchantable stands	48,700	35.0	20,860	29.3	269,300	557,000
All unmerchantable stands	90,300	65.0	50,310	70.7	670,800	1,343,200
All forest land	139,000	100.0	71,170	100.0	940,100	1,900,200

1/ Based on the International 1/4-inch rule which closely approximates green lumber tally.

Table 16 - Volume in merchantable stands by species groups

Merchantable class and species group	Saw-timber volume (lumber tally)		Total volume (including bark)					
	M bd.ft.	Percent	M cu.ft.	Percent	Cords 1/	Percent	Tons 2/	Percent
Saw-timber stands								
Conifers	16,000	48.2	3,910	37.0	46,000	34.1	81,600	30.1
Oaks, hickory, and hard maple	9,900	29.8	3,540	33.5	47,200	35.0	108,600	40.1
Other hardwoods	7,300	22.0	3,120	29.5	41,600	30.9	80,600	29.8
All species	33,200	100.0	10,570	100.0	134,800	100.0	270,800	100.0
Pole-timber stands								
Conifers	3,500	22.4	1,710	16.6	20,100	15.0	35,600	12.4
Oaks, hickory, and hard maple	7,800	50.7	5,720	55.6	76,300	56.7	175,500	61.4
Other hardwoods	4,200	26.9	2,860	27.8	38,100	28.3	75,100	26.2
All species	15,500	100.0	10,290	100.0	134,500	100.0	286,200	100.0
All merchantable stands	48,700		20,860		269,300		557,000	

1/ Based on 85 cubic feet per cord for conifers and 75 cubic feet per cord for hardwoods.

2/ Based on cubic feet-per-ton converting factors for the principal species.

Table 17 - Board foot volume in merchantable saw-timber stands by diameter classes and species groups

Diameter class (d.b.h.)	Conifers 1/		Oaks, hickory, hard maple 2/		Other hardwoods 3/		All Species	
Inches	M bd.ft.	Percent	M bd.ft.	Percent	M bd.ft.	Percent	M bd.ft.	Percent
10	2,200	13.7					2,200	6.6
12	2,900	18.1	2,200	22.2	1,900	26.0	7,000	21.1
14	3,100	19.5	2,300	23.2	1,600	21.9	7,000	21.1
16	2,800	17.5	2,100	21.2	1,400	19.2	6,300	19.0
18	2,100	13.1	1,700	17.2	1,000	13.7	4,800	14.5
20	1,700	10.6	800	8.1	700	9.6	3,200	9.6
22 & up	1,200	7.5	800	8.1	700	9.6	2,700	8.1
All classes	16,000	100.0	9,900	100.0	7,300	100.0	33,200	100.0

1/ Principally white pine, hemlock and pitch pine, with some black spruce.

2/ Principally white oak, red oak, and hard maple, with some hickory and chestnut, black, scarlet and pin oak.

3/ Principally red maple, beech, yellow birch and white ash, with some black cherry, black birch, walnut, basswood, elm, sycamore and willow.

Table 18 - Cubic foot volume in merchantable pole-timber stands by diameter classes and species groups

Diameter class (d.b.h.)	Conifers 1/			Oaks, hickory, and hard maple 2/			Other hardwoods 3/			All species		
Inches	M cu.ft.	Percent	Tons	M cu.ft.	Percent	Tons	M cu.ft.	Percent	Tons	M cu.ft.	Percent	Tons
6	170	9.9	3,500	1,090	19.1	33,500	540	18.9	14,200	1,800	17.5	51,200
8	320	18.7	6,600	1,310	22.9	40,200	810	28.3	21,200	2,440	23.7	68,000
10	410	24.0	8,600	1,260	22.0	38,600	700	24.5	18,400	2,370	23.0	65,600
12	400	23.4	8,300	1,050	18.4	32,300	370	12.9	9,700	1,820	17.7	50,300
14 & up	410	24.0	8,600	1,010	17.6	30,900	440	15.4	11,600	1,860	18.1	51,100
All classes	1,710	100.0	35,600	5,720	100.0	175,500	2,860	100.0	75,100	10,290	100.0	286,200

1/ Principally white pine, hemlock, and pitch pine, with some black spruce.

2/ Principally white, red, and chestnut oak, and hard maple, with some hickory and black oak, scarlet oak, and pin oak.

3/ Principally red maple, yellow birch, beech, and white ash, with some black cherry, black birch, walnut, basswood, elm, sycamore, willow and aspen.

Anthracite Survey Papers

No.	Title
1	Survey of Forest Employment Possibilities in the Anthracite Region of Pennsylvania*
2	Intensified Protection of Wyoming Valley Forests Against Fire Through Use of Community Labor*
3	Tax Delinquency of Forest Lands in the Anthracite Region of Pennsylvania**
4	Volume Tables for Commercial Timber in the Anthracite Region of Pennsylvania*
5	The Forests of Luzerne County, Pennsylvania, in Relation to Employment and Welfare
6	The Population and Employment Outlook for the Anthracite Region of Pennsylvania
7	The Forest Situation in Pike and Monroe Counties
8	The Forest Situation in Dauphin and Lebanon Counties
9	The Forest Situation in Schuylkill and Carbon Counties
10	The Forest Situation in Wyoming and Sullivan Counties
11	The Forest Situation in Northumberland, Columbia, and Montour Counties
12	The Forest Situation in Luzerne and Lackawanna Counties
13	The Forest Situation in Wayne and Susquehanna Counties

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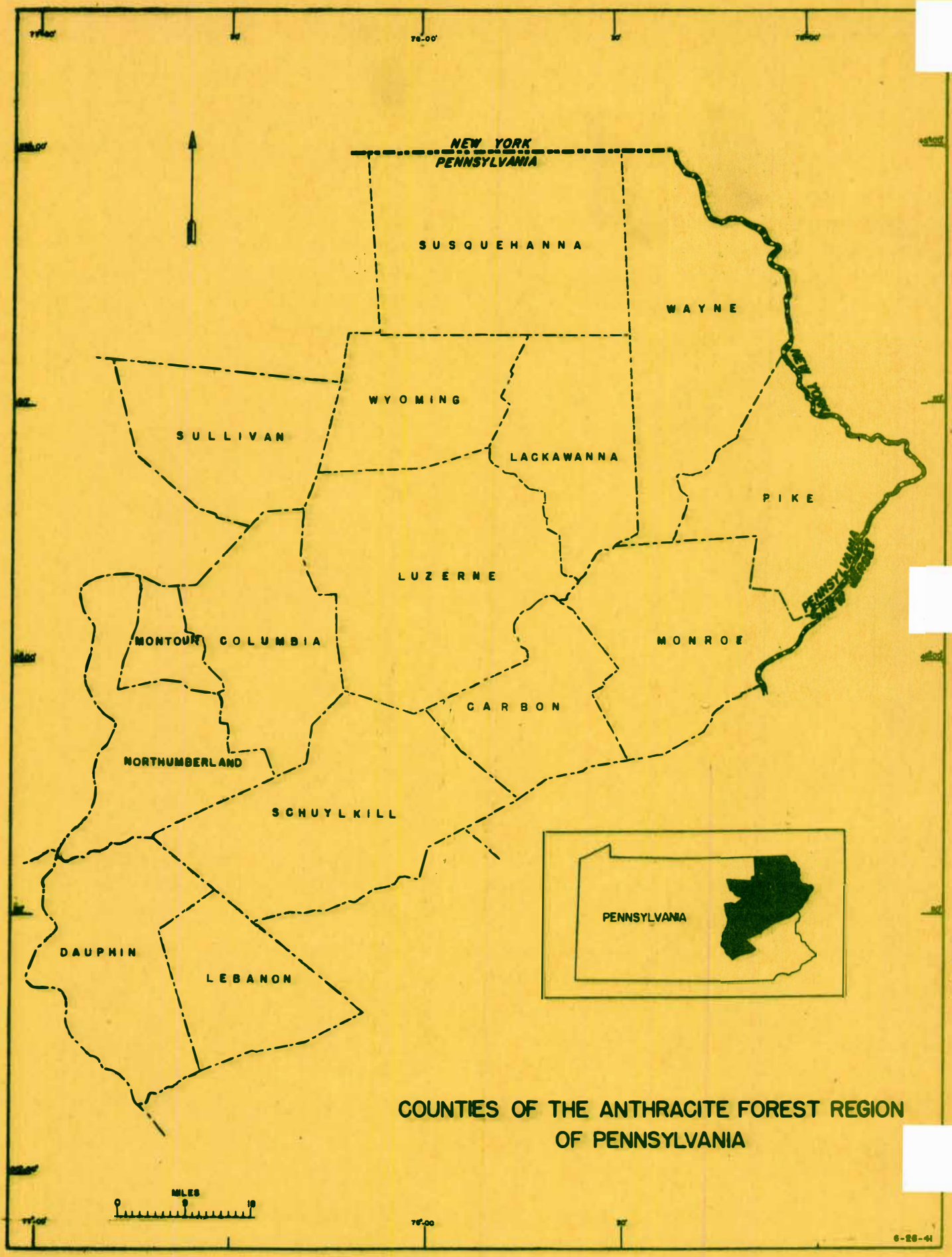

COUNTIES OF THE ANTHRACITE FOREST REGION
OF PENNSYLVANIA